Streamlined Technology-Driven Orchestration for Effective Teaching
Lighton Phiri¹, Christoph Meinel² and Hussein Suleman¹
¹Department of Computer Science, University of Cape Town, South Africa
²Hasso Plattner Institute, University of Potsdam, Germany

Introduction

Effective classroom management [1] is considered a key criterion for turning formal learning spaces into effective learning environments. However, contemporary classroom orchestration [2] is arguably ad hoc and challenging, primarily due to its multi-faceted nature.

Working with Dillenbourg’s view of orchestration [3], we propose/investigate streamlined technology-driven orchestration through the use of an orchestration workbench.

Orchestration Workbench

Key orchestration workbench framework aspects
- Process management
- Sequencing management
- Time management

![Orchestration Workbench Diagram]

Scientific Goals

- Investigate the impact of an orchestration workbench on teaching and learning
- Devise a generic orchestration workbench framework for achieving streamlined technology-driven orchestration
- Demonstrate the successful use of streamlined technology-driven orchestration

Experimental Methods

Prototype 1 ... Prototype N

Applicability

In Vivo

Experiment 1 ...

Goal-Question Metrics

Figure 2. Experimental Methods

Evidence gathered using a combination of case studies and controlled experiments, in order to assess generalisation and applicability of orchestration workbench

Experimental Results

- Flipped classroom experiment for a second year computer architecture course to explore organised orchestration

<table>
<thead>
<tr>
<th>Activity</th>
<th>Orchestration</th>
<th>Orchestration Aspect</th>
<th>Tooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstration</td>
<td>Live demonstrations</td>
<td>Class</td>
<td>Information rendering</td>
</tr>
<tr>
<td>Discussion</td>
<td>Interactive discussions</td>
<td>Class &amp; Individual</td>
<td>Information rendering</td>
</tr>
<tr>
<td>Quiz</td>
<td>Timed &amp; graded quiz</td>
<td>Individual</td>
<td>Information rendering</td>
</tr>
</tbody>
</table>

Table 1. Orchestration of Flipped Classroom Activities

![Orchestrated Flipped Classroom Timeline]

![Flipped Classroom Streamlined Technology-driven Orchestration]

Future Direction

Establish a generic orchestration framework and demonstrate its applicability using real-world case studies

Acknowledgements

This work was made possible through the gracious support of the Hasso Plattner Institute

Bibliography